Exhibit I

THE "LESS THAN" EFFICIENT CAPITAL MARKETS HYPOTHESIS: REQUIRING MORE PROOF FROM PLAINTIFFS IN FRAUD-ON-THE-MARKET CASES

PAUL A. FERRILLO[†], FREDERICK C. DUNBAR, PH.D.[††] & DAVID TABAK, PH.D.[†††]

In 1988, the United States Supreme Court in *Basic Inc. v. Levinson*[1] created a "rebuttable" presumption of reliance[2] for all members of a class alleging misstatements or omissions of material fact in their purchase or sale of securities of an issuer.[3] This presumption allows a plaintiff, without any showing that he or she actually read or heard a misrepresentation, to assert, on a motion for class certification under Rule 23(b)(3) of the Federal Rules of Civil Procedure, that common issues with respect to reliance predominate over any individual issues of reliance present among the proposed class members.[4] The presumption switches the burden to the defendant to "disprove actual reliance."[5] If the defendant is unable to make such a showing, the proposed class may be certified.[6]

The *Basic* Court founded its decision in reliance upon the fraud on the market theory, which is premised upon the efficient

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[†] Paul Ferrillo is Of Counsel in the Business and Securities Litigation Department of Weil Gotshal & Manges, LLP in New York City.

[††] Senior Vice President, NERA Economic Consulting.

[†††] Vice President, NERA Economic Consulting.

[1] 485 U.S. 224 (1988).

[2] Reliance is one of the required elements of a claim under section 10(b) of the Securities and Exchange Act of 1934. 15 U.S.C. § 78j(b) (2003).

[3] *See Basic*, 485 U.S. at 245.

[4] *See id.* at 242.

[5] Lipton v. Documation, Inc., 734 F.2d 740, 746 (11th Cir. 1984) (stating that once a plaintiff alleges reliance on market prices when buying a securities, the defendant then has the burden of disproving any actual reliance) (citing Blackie v. Barack, 524 F.2d 891 (9th Cir. 1955)).

[6] *See Basic*, 485 U.S. at 250.

capital markets hypothesis. Specifically, the plurality opinion noted that:

> "The fraud on the market theory is based on the hypothesis that, in an open and developed securities market, the price of a company's stock is determined by the available material information regarding the company and its business. . . . Misleading statements will therefore defraud purchasers of stock even if the purchasers do not directly rely on the misstatements."[7]

The *Basic* Court was clear to note that the fraud on the market's "rebuttable presumption of reliance" was indeed rebuttable, and was conditioned upon, among other things, a finding that the market for a particular stock was "impersonal [and] well-developed."[8] For example, it has been held that the fraud on the market presumption could fail "where a defendant shows that an 'individual plaintiff traded or would have traded despite his knowing the statement was false,' or makes '[a]ny showing that severs the link between the alleged

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[7] *Id.* at 241–42 (quoting Peil v. Speiser, 806 F.2d 1154, 1160 (3d Cir. 1986)) (alteration in original). It is interesting to note that in *Peil v. Speiser*, the court "affirmatively declined to specifically define the term 'open and developed market.'" Cammer v. Bloom, 711 F. Supp. 1264, 1276 (D.N.J. 1989). There are three generally accepted versions of the efficient capital markets hypothesis:

> In a strong-form efficient market, all information that exists about a company and would be of interest to a purchaser of the company's securities is reflected, nearly instantaneously, in the price of the stock, such that no individual can expect to gain a greater return from that security than from any other security, and no individual can hope to perform better than any other individual over the long term. The weak form of the ECMH, by contrast, proposes that the price of the stock eventually reflects publicly available information. . . .
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> Semi-strong efficiency, which . . . [holds] that most information about a company is reflected in its price fairly quickly, appears to be the form assumed to exist by the United States Supreme Court in *Basic*.

Kaufman v. i-Stat Corp., 754 A.2d 1188, 1198 (N.J. 2000) (internal citations omitted); *see infra* Part III.A. The definitions of the *Kaufman* court for the weak and semi-strong form are actually not those universally accepted in financial economics. *See infra* Part III. Other commentators have specifically defined some of the terms underlying the fraud on the market theory. *See, e.g.*, ALAN R. BROMBERG & LEWIS D. LOWENFELS, 3 BROMBERG AND LOWENFELS ON SECURITIES FRAUD & COMMODITIES FRAUD § 8.6(641) (2d ed. 2003) [hereinafter BROMBERG] (defining a "developed market" as one "which has a high level of activity and frequency, and for which trading information (e.g., price and volume) is widely available," and an "efficient market" as "one which rapidly reflects new information in price").

[8] *See Basic*, 485 U.S. at 247, 249 n.28.

misrepresentation and either the price received (or paid) by the plaintiff, or his decision to trade at a fair market price.' "[9]

In the years since the Supreme Court decided *Basic*, courts have struggled with the fraud on the market theory, fashioning their own theories, concepts, and tests to determine when a stock can be found to have traded in an "efficient" market.[10] As the case law has gotten arguably less cohesive, scholarship on the efficient capital markets hypothesis has revealed empirical anomalies and debatable assumptions calling for a more complicated view of securities markets.

Consequently, rather than being supportive, recent research into the efficient capital markets hypothesis has been critical at best. Scholars have pointed to many holes in both the theory and its predictions, including a lack of correlation in the price movements of individual stocks to public announcements,[11] "noise trading,"[12] irrational investors, and the limits of arbitrage, and have concluded, like the thesis of this article, that the efficient capital markets hypothesis is sometimes less than efficient for a given security.[13] So, in sum, if courts have struggled previously with "indicia" of an efficient market in the past, their task in the future could be even more complex as the intellectual underpinnings of the fraud on the market theory have come under attack.

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[9] Cromer Finance Ltd. v. Berger, 205 F.R.D. 113, 129 (S.D.N.Y. 2001) (internal citations omitted); *see* Krogman v. Sterritt, 202 F.R.D. 467, 473 (N.D. Tex. 2001) ("A defendant may rebut [the fraud on the market] presumption by showing that the stock price was unaffected by the fraud, or that the plaintiff would have made the purchase regardless of the undisclosed information.") (citing Zlotnick v. TIE Comm., 836 F.2d 818, 822 (3d Cir. 1988)).

[10] *See, e.g.*, *Krogman*, 202 F.R.D. at 474 (discussing additional factors pertaining to market efficiency, such as "(1) the capitalization of the company; (2) the bid-ask spread of the stock; and (3) the percentage of stock not held by insiders (the 'float')" (internal citations omitted)); *Cammer*, 711 F. Supp. at 1286–87 (fashioning a five-part analysis for determining whether or not a stock traded in an efficient market).

[11] *See* Richard Roll, R^2, 43 J. FIN. 541, 557–61 (1988) (finding that aside from issuers which are involved in takeovers or "major disasters," there is generally little connection between volatility and company specific news releases).

[12] *See generally* Fischer Black, *Noise*, 41 J. FIN. 529 (1986) (explaining that "noise" in the market comes from "uncertainty about future demand and supply conditions within and across sectors" and creates inefficiency).

[13] *See generally* ANDREI SHLEIFER, INEFFICIENT MARKETS: AN INTRODUCTION TO BEHAVIORAL FINANCE 9–11 (2000) (discussing an alternative approach to the efficient markets hypothesis).

But as we set forth herein, a court's journey through over 30 years of "efficient capital markets" and "fraud on the market" dogma can be simplified by requiring plaintiffs who seek to rely on the presumption of reliance on a motion for class certification under Rule 23 to make some affirmative showing that the stock at issue traded in an "efficient market."[14] Clearly one determinative inquiry here is analysis of the reaction of the issuer's stock price to corporate news and events to ascertain whether the stock price accurately and timely incorporates all such publicly available information.[15] If it can be shown, at the very least, that the company's stock price responded rapidly to news and unexpected information and was not overly volatile in the absence of such news these would be important, and perhaps even compelling, indicators of an efficient market.[16] If, on the other hand, a showing is made that the company's stock price is "random" in response to fundamental information and inexplicably "volatile" when there is no change in fundamentals, then a finding might resultantly be made that such stock did not trade in an efficient manner during the class period. In fact, this type of showing is neither unfamiliar to the plaintiffs' bar nor the defense bar for that matter. Because current securities law principles under Rule 23 place the burden to show the presumption of reliance exists in any set of facts warranting class certification on the plaintiff,[17] this analysis should be

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[14] *See In re* Accelr8 Tech. Corp. Sec. Litig., 147 F. Supp. 2d 1049, 1056 (D. Colo. 2001) ("Plaintiffs who invoke the 'fraud on the market theory' have the burden of establishing the securities were traded on an efficient market.") (citations omitted).

[15] In one of the leading cases on point in this area, *Cammer v. Bloom*, the court stated that the timely price reaction of a company's stock to public information is the "essence of an efficient market and the foundation for the fraud on the market theory." *Cammer*, 711 F. Supp. at 1287.

[16] *See, e.g.*, Krogman v. Sterritt, 202 F.R.D. 467, 477 (N.D. Tex. 2001) (concluding that the plaintiffs' failure to demonstrate a relationship between changes in the stock price and news disclosures "weigh[ed] heavily against a finding of market efficiency").

[17] *See generally* Stirman v. Exxon Corp., 280 F.3d 554, 562 (5th Cir. 2002) ("The party seeking [class] certification bears the burden of demonstrating that the rule 23 requirements have been met."); *In re* Am. Med. Sys., Inc., 75 F.3d 1069, 1079 (6th Cir. 1996) ("The party seeking the class certification bears the burden of proof. Subsection (a) of [r]ule 23 contains four prerequisites which must *all* be met before a class can be certified. . . .[T]he party seeking certification must also demonstrate that it falls within at least *one* of the subcategories of [r]ule 23(b).") (internal citations omitted).

required of plaintiffs, as it might dramatically and forcefully assist a court in certifying, or not, a proposed class.

Part I of this article discusses the plurality and dissenting opinions in *Basic v. Levinson*. Part II describes how courts since *Basic* have interpreted and viewed questions addressing whether a particular stock at issue traded in an efficient market. Part III turns its attention to the efficient capital markets hypothesis and review research that draws into question the underpinnings of the efficient capital markets hypothesis. Part IV discusses other tests of the efficient markets hypothesis. Part V applies many of the lessons of behavior finance to the Internet bubble. Finally, Part VI argues that given the "less than" efficient capital markets hypothesis for certain categories or classes of stock, plaintiffs should be required to earn their rebuttable presumption of reliance by at least making some concrete showing, through a price reaction analysis, that the stock upon which they are suing behaved in an "efficient" manner, by responding rapidly to corporate news and events and performing as finance theory would predict in the absence of such.

I. DISSECTING BASIC V. LEVINSON

A. *The Plurality Opinion*

In *Basic*, the Supreme Court was presented with a decision of the United States Court of Appeals for the Sixth Circuit, which affirmed the grant of class certification in favor of a class of Basic Incorporated ("Basic") stockholders.[18]

The stockholders brought their claims against Basic, its directors and its officers under section 10(b) and Rule 10b-5 of the Securities Exchange Act of 1934 ("1934 Act"). The stockholders claimed they were injured by selling their shares in Basic at artificially depressed prices after the company denied that it was in merger negotiations with another company.[19] The district court granted plaintiffs' motion for class certification. In doing so, it "adopted a presumption of reliance by members of the plaintiff class upon [Basic's] public statements that enabled

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[18] Basic Inc. v. Levinson, 485 U.S. 224, 229 (1988).

[19] *Id.* at 228. We limit ourselves here to the *Basic* Court's discussion of the class certification issues in the case. It is important to note that the Court was also presented with the issue of whether the company's merger discussions were "material" under the securities laws. *Id.* at 240–41.

the court to conclude that common questions of fact or law predominated over particular questions pertaining to individual plaintiffs."[20] The Sixth Circuit followed several other circuits in recognizing the "fraud-on-the-market-theory" as creating a rebuttable presumption that the stockholders relied on Basic's alleged material misrepresentations, and accordingly affirmed the decision of the district court.[21]

Upon review, the Supreme Court first made it clear that it was not terribly interested in formally reviewing the underpinnings of the efficient capital markets hypothesis, the backbone of the fraud on the market theory. Without a great deal of deliberation, the Court acknowledged the rationale of other courts that the fraud on the market theory was valid in light of the nature of the U.S. securities markets.[22] It stated that it "need not determine by adjudication what economists and social scientists have debated through the use of sophisticated statistical analysis and the application of economic theory."[23] The Court noted that "[t]he modern securities markets, literally involving millions of shares changing hands daily, differ from the face-to-face transactions contemplated by early fraud cases, and our understanding of Rule 10b-5's reliance requirement must encompass these differences."[24] Looking to several decisions of the lower courts, and "[r]ecent empirical studies," the Court also accepted the efficient markets hypothesis and its proposition that "the market price of shares traded on well-developed markets reflects all publicly available information, and, hence, any material misrepresentations."[25]

The *Basic* Court then turned its attention to whether a "presumption of reliance" created by the fraud on the market theory was proper in circumstances where direct proof is lacking.[26] The Court noted, and apparently acknowledged, the district court's finding that the "presumption of reliance created

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[20] *Id.* at 228.

[21] *Id.* at 229.

[22] *See id.* at 243–44.

[23] *Id.* at 246–47 n.24.

[24] *Id.* at 243–44.

[25] *Id.* at 246. The Court further commented, "It has been noted that 'it is hard to imagine that there ever is a buyer or seller who does not rely on market integrity. Who would knowingly roll the dice in a crooked crap game?' " *Id.* at 246–47 (quoting Schlanger v. Four-Phase Sys., Inc., 555 F. Supp. 535, 538 (S.D.N.Y. 1982)).

[26] *Id.* at 245.

by the fraud-on-the-market theory provided a practical resolution to the problem of balancing the substantive requirement of proof of reliance in securities cases against the procedural requisites of [Federal Rule of Civil Procedure] 23."[27] Here, the Court commented that

> [r]equiring a plaintiff to show a speculative state of facts, i.e., how he would have acted if omitted material information had been disclosed, or if the misrepresentation had not been made, would place an unnecessarily unrealistic evidentiary burden on the [r]ule 10b-5 plaintiff who has traded on an impersonal market.
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> Arising out of considerations of fairness, public policy, and probability, as well as judicial economy, presumptions are also useful devices for allocating the burdens of proof between parties. The presumption of reliance employed in this case is consistent with, and, by facilitating [r]ule 10b-5 litigation, supports, the congressional policy embodied in the 1934 Act.[28]

Finally, the *Basic* Court commented upon the rebuttable nature of the presumption. In general, the Court commented that "[a]ny showing that severs the link between the alleged misrepresentation and either the price received (or paid) by the plaintiff, or his decision to trade at a fair market price, will be sufficient to rebut the presumption of reliance." [29] According to the Court, the presumption could be rebutted by showing, for example, that (1) the market makers were privy to the truth, and thus the market price would not have been affected by any alleged misrepresentation, or by showing (2) that the plaintiffs divested themselves of shares in the company without relying on the integrity of the market.[30]

B. The Dissenting Opinion

Justice White wrote the dissenting opinion in *Basic*. He inherently recognized the potential problems that may result when courts are asked to intermingle legal concepts with economic theories. Those problems, he stated, are many. Justice White first expressed apprehension that the majority's decision went too far beyond the Court's previous holdings in fraud cases

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[27] *Id.* at 242 (alteration in original) (internal citations and quotes omitted).
[28] *Id.* at 245 (internal citations omitted).
[29] *Id.* at 248.
[30] *Id.* at 248–49.

and then proposed that a change to the understanding of Rule 10b-5's reliance requirement—if proper at all—come from Congress, and not the Court.[31]

Second, Justice White noted the potential for confusion when trying to interpret the standard for market efficiency announced by the majority.[32] As Justice White said, the phrase "integrity of the market price" implies that a stock has a "true value" that is measurable by some definable standard and upon which investors always rely in making their investment decision.[33] Justice White then observed that investment decisions are often made due to perceptions by investors that a stock price "*inaccurately* reflects" the underlying value of the corporation, and furthermore predicted (rather clairvoyantly, given later research discussed below) that

> [i]f investors really believed that stock prices reflected a stock's "value," many sellers would never sell, and many buyers never buy (given the time and cost associated with executing a stock transaction). As we recognized just a few years ago: [I]nvestors act on inevitably incomplete or inaccurate information, [consequently] there are always winners and losers; but those who have 'lost' have not necessarily been defrauded.[34]

Justice White concluded that while the Court should not "retreat" from the "many protections" afforded investors by prior interpretations of section 10(b) and Rule 10b-5, movement beyond such decisions towards "something closer to an investor insurance scheme" should be the result of federal legislative action.[35]

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[31] *See id.* at 253–54 (remarking that "[e]ven if I agreed with the Court that modern securities markets . . . require that the understanding of [r]ule 10b-5's reliance requirement be changed," Justice White would still "prefer that such changes come from Congress") (internal citations and quotes omitted).

[32] *See id.* at 252–53 (noting that without "staff economists [or] experts schooled in the 'efficient-capital-market-hypothesis' " nor any "ability to test the validity of empirical market studies," courts are in poor position "to embrace novel constructions of a statute based on contemporary microeconomic theory").

[33] *See id.* at 255–56.

[34] *See id.* at 256 (alteration in original).

[35] *See id.* at 256–57, 262–63 (further noting that the Court had "previously recognized that 'inexorably broadening . . . the class of plaintiff[s] who may sue in this area of the law will ultimately result in more harm than good" and fearing that "such a bitter harvest [was] likely to be . . . reaped from the seeds sewn by" the majority's decision) (internal citations omitted).

II. THE LOWER COURTS' INTERPRETATION OF *BASIC*

A. Cammer v. Bloom

A little over one year after *Basic*, *Cammer v. Bloom*[36] was decided by the United States District Court for the District of New Jersey. *Cammer* was a securities fraud class action brought under sections 10(b) and 20(a) of the 1934 Act against a company called Coated Sales, Inc. ("Coated Sales") and its officers and directors. The action was brought shortly after Coated Sales filed for bankruptcy after it announced to the public that it overstated its financial condition for the previous two years.[37] As noted by the court in *Cammer*, Coated Sales's publicly held securities were "not listed on a national exchange, but instead [were] traded in the 'over-the-counter' market . . . and listed on" NASDAQ.[38]

The auditor's motion to dismiss, among other things, specifically focused upon whether the plaintiffs could show reliance in connection with their purchases of Coated Sales securities. In fact, the court's decision noted that in earlier proceedings, plaintiffs' counsel apparently conceded plaintiffs could not show direct reliance.[39] Thus, it was incumbent upon the parties to show, or rebut, reliance upon the fraud-on-the-market theory.[40]

The court in *Cammer* quickly determined its challenge:

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[36] 711 F. Supp. 1264 (D.N.J. 1989).

[37] *See id.* at 1270–71.

[38] *Id.* at 1271. As elaborated by the *Cammer* court later in its opinion, the defendant auditor, among other things, pressed the argument that the fraud-on-the-market theory was not available to the plaintiffs since the Coated Sales stock traded as an over-the-counter security, rather than on a "national exchange." *Id.* at 1280. Thus the auditor's focus was on challenging the efficiency of the entire over-the-counter market itself, rather than on the individual "market" for the Coated Sales stock. The *Cammer* court went on to discuss the various arguments that certain securities markets are inherently "inefficient" based upon the way the securities trade and how stock prices are determined in such markets. *See id.* at 1281–82. We will not discuss herein the validity of this "market driven" argument other than to say that the argument does exist, *see, e.g.*, Krogman v. Sterritt, 202 F.R.D. 467, 474 (N.D. Tex. 2001); Harman v. Lyphomed, Inc., 122 F.R.D. 522, 525 (N.D. Ill. 1988), but was not given credence by the *Cammer* court. *See also Krogman*, 202 F.R.D. at 474 (noting "the majority of courts hold that the 'inquiry in an individual case remains the development of the market for that stock, and not the location where the stock trades.' ") (quoting *Harman*, 122 F.R.D. at 525).

[39] *See Cammer*, 711 F. Supp. at 1273 n.12.

[40] *See id.* at 1273–74.

> Although *Peil* [*v. Speiser*] makes it clear 'the fraud on the market theory rests on the assumption that there is a nearly perfect market of information,' the Third Circuit affirmatively declined to specifically define the term 'open and developed market.' It stated that '[a]s the case at bar involves a widely traded and established stock, we need not consider whether we would apply the fraud on the market theory in other instances.' This unanswered question in *Peil* goes to the heart of [the auditor's] motion.[41]

After reviewing the characteristics of the national trading exchanges versus the over-the-counter market, the court narrowed the issue further, remarking that the appropriate inquiry focused on "whether market makers in the over-the-counter market . . . provided a sufficiently fluid and informed trading environment," thus allowing investors to make trading decisions "at informed . . . bid and asked prices."[42] The court next discussed some of the factors that it considered relevant in this analysis. Since they were important to the court in *Cammer*, and continue to be important to other courts, we discuss each of these factors in turn:

1. Eligibility to File an SEC Form S-3

In *Cammer*, the auditor claimed that because Coated Sales was not eligible to file a Form S-3 during the class period, the fraud-on-the-market theory should be inapplicable as a matter of law.[43] Though not a dispositive factor,[44] the court considered

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[41] *Id.* at 1276 (citations omitted).

[42] *Id.* at 1282–83. In this regard, the plaintiffs proffered certain facts "relevant to the market for Coated Sales stock . . . ." Among them:

> [1] Coated Sales stock was traded in an impersonal market involving brokers, rather than in face to face transactions;
> [2] During the Class Period, 19 million shares of Coated Sales stock were outstanding, of which some 12 to 13 million shares were owned by non-insiders of the Company . . . ;
> [3]Coated Sales stock was held by 1200 shareholders of record; . . . some 44 million shares of Coated Sales were traded, representing an average weekly trading volume of 750,000 shares . . . ;
> [4]Coated Sales had 11 marketmakers who issued competing price quotations on the NASDAQ system . . . ;
> [5] Coated Sales was the subject of substantial interest by analysts. At least 15 research reports on the Company were issued from July 1987 through June 1988.

Id. at 1283 n.30.

[43] The court noted earlier in its opinion that

> [t]o be eligible to use Form S-3 in connection with an equity offering, an

Form S-3 eligibility important, and weighing in favor of market efficiency, as the concept behind using the document to fulfill disclosure obligations through "integration" or "incorporation by reference" expressly assumed an underlying "efficient market" for the security as issue. The court here quoted the SEC's pronouncement that:

> Under the proposed registration statement framework, registrants would be classified into three categories: (1) companies which are widely followed by professional analysts; (2) companies which have been subject to the periodic reporting system of the Exchange Act for three or more years, but which are not widely followed; and (3) companies which have been in the Exchange Act reporting system for less than three years. The first category would be eligible to use proposed Form S-3, which relies on incorporation by reference of Exchange Act reports and contains minimal disclosure in the prospectus. The form is predicated on the Commission's belief that the market operates efficiently for these companies, i.e., that the disclosure in Exchange Act reports and other communications by the registrant, such as press releases, has already been disseminated and accounted for by the marketplace.
>
> Proposed Form S-3 recognizes the applicability of the efficient market theory to the registration statement framework with respect to those registrants which usually provide high quality corporate reports, including Exchange Act reports, and whose corporate information is broadly disseminated, because such companies are widely followed by professional analysts and investors in the market place.[45]

So, as the court noted in *Cammer*, the Form S-3 filing requirements inherently presumed some measure of market efficiency, through disclosure obligations and information dissemination, which breed both analyst coverage and an investor following.

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issuer must, among other things, have been filing reports under the Exchange Act for at least thirty-six months and either have outstanding $150 million of voting stock held by non-affiliates or $100 million of such stock outstanding coupled with an annual trading volume of three million shares per year.

Id. at 1271 n.5.

[44] Coated Sales was not a public filer for at least 36 months and thus was not eligible to use Form S-3. *See id.* at 1285.

[45] *Id.* at 1284–85 (quoting Exchange Act Release No. 6331, 46 Fed. Reg. 41,902 (Aug. 13, 1981) (emphasis omitted).

2. Average Weekly Trading Volume

Relying in large part on previous academic analysis of what constitutes an "open" or "developed" market,[46] the court next looked to other factors that it found relevant to showing that a stock traded in an open and developed market. One factor that the court felt that the plaintiffs could have alleged was the existence of "an average weekly trading volume during the class period in excess of a certain number of shares."[47] According to the court, the existence of an actively traded market, as evidenced by a large weekly volume of stock trades, indicates an "efficient market" fostered by "significant investor interest," thus implicitly indicating the likelihood that trades are in fact being executed due to "newly available or disseminated corporate information."[48]

3. Analyst Coverage

According to the *Cammer* court, the existence of a significant number of securities analysts would imply the financial information and other disclosures concerning Coated Sales were reviewed by investment professionals, who would make buy and sell recommendations to client investors. In this way, the court stated that the price of Coated Sales stock "would be bid up or down to reflect the financial information" and other information regarding Coated Sales.[49]

4. Existence of Market Makers and Arbitrageurs

Existence of market makers and arbitrageurs would, according to the court, "ensure completion of the market mechanism" by trading stock soon after disclosure of "company news and reported financial results" and thus "[drive] it to a changed price level."[50]

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[46] *See id.* at 1286 n.35.

[47] *Id.* at 1286. Lawyers had previously surmised about the importance of this element. *See* BROMBERG, *supra* note 7, at § 8.6(641) ("Turnover measured by average weekly trading of 2% or more of the outstanding shares would justify a strong presumption that the market for the security is an efficient one; 1% would justify a substantial presumption.").

[48] *See Cammer*, 711 F. Supp. at 1286.

[49] *Id.*

[50] *Id.* at 1286–87.

5. Price Reaction to Company-Specific Information

Finally, the Court indicated that in asserting an efficient market, a plaintiff should offer empirical proof linking "unexpected corporate events or financial releases" to immediate change in the stock price.[51]

B. *Recapping* Cammer

Though placing great weight on the filing of a Form S-3, the *Cammer* Court set forth a series of other factors that lack objective guidelines for other courts to follow. Perhaps this was due to the lack of information it was presented by the plaintiffs in *Cammer*.[52] Perhaps it was also due, as Judge White suggested in his dissent in *Basic*, to the court being ill-equipped to determine and analyze the fundamentals of market efficiency; i.e., in the court's view, "how many" analysts were needed to ensure that information concerning a company finds its way, through buy and sell recommendations,[53] into the price of a company's stock, and "how many" market makers were needed to ensure the market's "swift" incorporation of company news into the price of a company's stock.[54] We also note that though the court considered the reaction of a company's stock price to company specific news, the "essence" of market efficiency,[55] it provided no guidance to practitioners as to how to show—or to show the absence of—this fact when attempting to prove, or disprove, market efficiency. We see below that the lack of objective "market efficiency" criteria has caused courts to vary greatly in their approach to arguments for and against market efficiency.

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[51] *Id.* at 1287 (remarking further that such is both central to "an efficient market and the foundation for the fraud on the market theory").

[52] *See id.* In fact, given its guidelines and "some" evidence produced by the plaintiffs, it denied the auditor's motion to dismiss, finding a "genuine issue of material fact concerning the character of the market for Coated Sales stock." *See id.* at 1287.

[53] *See, e.g.*, Cheney v. Cyberguard Corp., 211 F.R.D. 478, 493–94 (S.D. Fla. 2002) (discussing court decisions addressing "how many" analysts covering a particular stock constituted a "substantial number" of analysts as elaborated upon by the *Cammer* court).

[54] *See id.* at 494 (discussing the relevance of the existence of market makers to the market efficiency analysis).

[55] *See Cammer*, 711 F. Supp. at 1287.

C. *Cases Since* Cammer

Courts that have engaged in a market efficiency analysis since *Cammer* can be characterized as generally falling into two schools of thought, neither of which is totally appropriate given the effect that the presumption of reliance has on whether or not a securities class action gets certified as a class. This article refers to these categories as follows: (1) The "Let's Deal with It Later" Approach; and (2) The "Subjective Guidelines Sort of Like Cammer" Approach. Without tongue in cheek, this article discusses each of these in turn.

1. The "Let's Deal with It Later Approach"

The "Let's Deal with It Later Approach" looks at the issue of market efficiency as a "pleading" one, rather than as a "burden of proof" one. Demonstrative of this approach is the decision of the Court of Appeals for the Third Circuit in *Hayes v. Gross*.[56] More often than not, this approach is seen at the "motion to dismiss" phase of a securities case. On occasion, however, it sometimes arises on the plaintiffs' motion for class certification. In *Hayes*, shareholders of Bell Saving Bank ("Bell") brought suit against its former directors and officers under section 10(b) of the 1934 Act alleging that they knowingly or recklessly misrepresented the financial and operating condition of Bell, which later fell under supervision of the Resolution Trust Corporation.[57] In their motion to dismiss, the defendants claimed, among other things, that the plaintiffs had not alleged either direct reliance on the alleged misrepresentations or "facts sufficient to support a 'fraud-on-the-market theory.' "[58] Given the procedural stage of the case, the court noted that the "question on a motion to dismiss is not whether plaintiff has proved an efficient market, but whether he has pleaded one."[59]

In this regard, the plaintiffs' complaint pled the following:

> [T]here was an open, efficient, impersonal and well developed market for the trading of shares of Bell wherein the market price reflected publicly disseminated information[;] . . . the average weekly trading volume for Bell stock was approximately 38,000 shares; . . . Bell stock was listed on the

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[56] 982 F.2d 104 (3d Cir. 1992).
[57] *See id.* at 105–06.
[58] *Id.* at 107.
[59] *Id.*

> NASDAQ/National Market System, which gave investors access to up-to-the-minute information, including real time prices; . . . and Bell was actively followed during the class period by at least five market analysts whose reports were widely disseminated to the public.[60]

On this set of the facts, the court found, without any further discussions, that the plaintiffs' complaint alleged an efficient market.[61]

In *Fellman v. Electro Optical Systems Corp.*,[62] the court appeared to focus on the *Cammer* factors even more sparingly. In that case, the court discussed the plaintiffs' allegations of reliance in the course of deciding the defendants' motion to dismiss. In support of the argument that they were entitled to rely on the fraud-on-the-market theory, the plaintiffs apparently alleged only that " 'during the Class Period, millions of shares of EOSC stock were actively traded on the Over-The-Counter Bulletin Board.' "[63] Based on this sole allegation, the court held that plaintiffs had sufficiently pleaded that EOSC traded in an "open and developed market."[64]

Finally, in *In re Nortel Networks Corp. Securities Litigation*,[65] the Court granted plaintiffs' motion for class certification over the opposition of the defendants, who argued, among other things, that the market for the defendant issuer's stock "was not efficiently driven by fundamental value, and that is the death knell to application of the fraud-on-the-market theory."[66] Rejecting the defendants' request to separately

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[60] *Id.*

[61] *Id.*; *see* Walsh v. Chittenden Corp., 798 F. Supp. 1043, 1051 (D. Vt. 1992) (in denying defendants' motion to dismiss, the court found that plaintiffs had pled reliance on the fraud on the market theory by alleging that " 'Chittenden's shares have traded on the public, efficient and national market known as [the] NASDAQ National Market System' " and that it "filed periodic public reports and [had a] trading volume during the class period [that] comprised over two million shares") (citations omitted); Seidman v. Am. Mobile Syst., Inc., 813 F. Supp. 323 (E.D. Pa. 1993) (motion to dismiss denied in part because complaint alleged an efficient market).

[62] 98 Civ. 6403, 2000 U.S. Dist. LEXIS 5324 (S.D.N.Y. Apr. 25, 2000).

[63] *Id.* at *37 (citations omitted).

[64] *Id.* Similarly, in *In re Rentway Securities Litigation*, 218 F.R.D. 101, 118 (W.D.Pa. 2003), the Court granted the plaintiffs' motion for class certification based, in large part, upon Rentway's status as a New York Stock Exchange listed company. No discussion was made of the Cammer factors.

[65] 01 Civ. 1855, 2003 U.S.Dist. LEXIS 15702, S.D.N.Y. Sept. 8, 2003

[66] *Id.* At *14.

determine whether or not the plaintiffs were entitled to rely on the fraud on the market presumption, the Court (without any discussion of the *Cammer* factors) granted class certification, noting that "[T]he parties have been afforded "substantial" opportunity to present their respective points of view."[67]

2. The "Subjective Guidelines Sort of Like Cammer" Approach

This is perhaps the more interesting subset of how courts view market efficiency arguments made by the parties to a securities fraud lawsuit. Either because the record before them is incomplete, at best because the litigants are uncertain as to what factual showings need be made to prove, or disprove, that the stock at issue traded efficiently during the class period, or because courts themselves are uncertain as to which of the *Cammer* factors are more important than the others, there exists a large body of post-*Basic*, post-*Cammer* case law that is all over the map. This article does not place fault, but rather describes some of these cases to set forth the issue at hand: the need for some definable, acceptable test of market efficiency that would help a court find that plaintiffs are truly entitled to a "presumption of reliance" in their securities fraud case.

Demonstrative of this approach is the court's decision in *Blatt v. Muse Technologies, Inc.*[68] In *Blatt*, the plaintiffs, shareholders of Muse Technologies, Inc. ("Muse"), brought section 10(b) claims against Muse, its former chairman, and its President and CEO, alleging that the defendants misrepresented the company's financial condition during the class period.[69] In their motion to dismiss the plaintiffs' amended complaint, the defendants called into question whether the plaintiffs were entitled to rely on the fraud-on-the-market theory's presumption

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[67] *Id.* at *17. Though it is not clear from its decision, the court apparently sided with plaintiffs' argument that it need not delve in the merits of the defendants' arguments regarding market efficiency at this stage of the proceeding, finding those arguments were questions of fact "that must await for resolution at trial." *Id.* at 16; *but see*, Kirkpatrick v. Bradford, 827 F.2d 718, 722 (11th Cir. 1987) (coming to the opposite conclusion that "a court may look beyond the allegations of the complaint in determining whether a motion for class certification should be granted."). Thus, the Court apparently felt it appropriate to continue to rely on the allegations of the plaintiffs' complaint that all members of the class relied upon Defendants' allegedly "deceptive and materially false and misleading statements to the investing public." *See* Id. at *3, *17-18.

[68] No. 01-11010-DPW, 2002 U.S. Dist. LEXIS 18466 (D. Mass. Aug. 27, 2002).

[69] *Id.* at *2–3.

of reliance. The defendants claimed that the timing of the plaintiffs' stock purchases demonstrated their indifference to the "integrity" of the price of Muse stock. The defendants also questioned the "openness and efficiency of the market on which Muse stock traded."[70]

After deferring on the former question, the court converted the later question into a "particularized inquiry" into whether the Muse stock traded efficiently during the class period, using the *Cammer* factors as guidelines[71] or at least it made a reasonable approximation of using those factors.

The court first noted that the weekly trading volume for Muse stock during the class period of 234,500 shares (1.8% of Muse's total outstanding shares) supported a finding of market efficiency. Here, the court noted *Cammer's* guidance that an " 'average weekly trading [volume] of two percent or more . . . would justify a strong presumption' " of market efficiency.[72]

Though an analysis of the second and fourth *Cammer* factors appeared to weigh against a finding of market efficiency,[73] the court instead jumped to the third *Cammer* factor, noting that the plaintiffs alleged "numerous financial institutions as market makers."[74] The court's view of the price reaction of Muse stock to news and corporate events seems at odds with the *Cammer* court's discussion of the importance of this factor, perhaps because of the anecdotal nature of the evidence presented. The opinion stated:

> Similarly, I do not consider a finding of market efficiency rendered necessary by the fact that the amended complaint

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[70] *See id.* at *44–45.

[71] *Id.* at *45–46.

[72] *Id.* at *47 (quoting Cammer v. Bloom, 711 F. Supp. 1264, 1286 (D.N.J. 1989).

[73] *See id.* at *47–48. As to the second factor, the number of market analysts following Muse, the court noted without much comment that "the lead plaintiffs do face some difficulty in meeting the second *Cammer* factor . . . . The amended complaint alleges that only Josephthal covered Muse's stock, and further admits the relationship not to have been a fully independent one." *Id.* (internal citations omitted). As to the fourth *Cammer* factor, the eligibility to use Form S-3, the court gave no weight to Muse's ineligibility to use the Form S-3 because it "was not timely with its necessary filings," stating that *Cammer* "expressly exempts ineligibility . . . because of timing factors." *Id.* at *47 (internal citations and quotes omitted). Here, the *Muse* court misread *Cammer*. The *Cammer* court neutralized the Form S-3 factor in its decision, not because of any failure of Coated Sales to timely file its reports (like Muse), but because it had not been filing publicly for the requisite 36 months.

[74] *Id.* at *47.

> successfully alleges only two instances that might demonstrate "immediate response" of Muse's stock price to "unexpected corporate events or financial releases," namely the short-lived rise in the immediate aftermath of Josephthal's May 1, 2000 "Buy" recommendation, and the steady decline following Muse's disclosures in its February 21, 2001 press release and filing announcing results of the first quarter of [the] fiscal year 2001. In particular, I do not consider the balance in favor of finding market efficiency to be overturned by the relatively undramatic performance of Muse's stock in the aftermath of the company's disclosures in its press release and filings announcing results for fiscal year 2000.[75]

Thus, based almost entirely on Muse's weekly trading volume and the number of market makers in Muse's stock, the court found that the defendants failed to overcome the presumption of plaintiff's reliance on market integrity in trading Muse stock. [76]

In In re *2TheMart.com Securities Litigation*,[77] the court relied almost exclusively on the alleged reaction of the defendants' stock to corporate news and events to conclude the plaintiffs could rely on the fraud on the market's presumption of reliance.[78] The court noted several instances in which the plaintiffs established a "cause and effect" relationship between company disclosures and resulting movements in stock price.[79]

Interestingly, the price movements of the defendants' stock were rapid, but also often extreme. For example, when the defendants announced that they had received $1.7 million in funding, that their web-site was in "'final development,'" and that they expected a second quarter launch date, the stock climbed during the course of three days from $3.50 per share on January 18, 1999, to $8.50 on January 19, 1999, to a high of $50 per share on January 20, 1999, then closing at $21.50 per share.[80] Furthermore, in response to public criticism, on January 27, 1999, the defendants issued a release "touting the

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[75] *Id.* at *48–49 (citations omitted).

[76] *Id. But see* Binder v. Gillespie, 184 F.3d 1059, 1065 (9th Cir. 1999) (noting that evidence of the presence of market makers and arbitrageurs only was insufficient as a matter of law to deem the market for the stock at issue efficient).

[77] 114 F. Supp. 2d 955 (C.D. Cal. 2000).

[78] *Id.* at 964–65. The stock of the defendant, an internet-based company, traded on the Electronic Bulletin Board. *Id.* at 958.

[79] *Id.* at 964–65.

[80] *Id.* at 964

abilities and experience" of one of the individual defendants and noting that they had "secured funding for the final development of [their] website," and the stock price rose from a price that day of $10.875, to a high of $17, before closing the following day at $16.125.[81] Indeed, the court could have viewed the first of these price movements as "volatile" in nature, which may have warranted a different, and less positive outcome for the plaintiffs.[82]

In *Serfaty v. International Automated Systems, Inc.*,[83] the plaintiffs brought suit against International Automated Systems, Inc. (IAS) and its president for securities law violations.[84] On plaintiffs' motion to certify a class of purchasers of IAS, the defendants challenged the plaintiffs' reliance on the fraud on the market theory, alleging that common questions of law with respect to reliance did not predominate over individual issues of reliance. The court applied each of the *Cammer* factors to find that IAS stock did not trade in an efficient manner during the class period.[85] The court's discussion of two of the factors is worthy of discussion.

a. Average Weekly Trading Volume

The plaintiffs' expert in *Serfaty* here presented evidence that IAS was actively traded on the Over-the-Counter Bulletin Board during the class period based on the total number of individual trades and the total trading volume.[86] The defendants' expert challenged plaintiffs' conclusion, noting the small float for IAS's stock. This expert also suggested that the fact that IAS trading volume exceeded the average daily volume for OTC Bulletin Board securities was not as important as the plaintiffs' expert indicated.[87] Despite the evidence proffered by plaintiffs, the court opined that the *Cammer* factor of large weekly trading volume did not tip the balance towards concluding that IAS's stock traded in an efficient market.[88]

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[81] *Id.*
[82] *See supra* text accompanying note 16.
[83] 180 F.R.D. 418 (D. Utah 1998).
[84] *Id.* at 419.
[85] *See id.* at 420–23.
[86] *Id.* at 421.
[87] *Id.*
[88] *Id.* at 422.

b. History of Immediate Movement of Stock Price

The court noted that the immediate movement of the stock price was the factor under which the plaintiffs had the strongest argument that IAS traded in an efficient market during the class period. Plaintiffs presented evidence that the price of IAS stock increased on June 10, 1997, as a result of an IAS press release touting IAS technology, and decreased on June 28, 1996, when the defendants failed to unveil their technology.[89] Defendants countered with evidence that the price reactions of IAS stock were not consistent with an efficient market.[90] In fact, the court itself noted the following:

> Examination of the OTC Daily Trading Summary offered by Defendants . . . shows that throughout the class period, the price of IAS shares fluctuated. For example, on May 22, the price closed at $36.25; the following day, it rose to $50.00. Similarly, on May 30, the price closed at $54.00; yet by June 7, the price had decreased to $34.00. Plaintiffs offer no specific evidence that these, and other significant changes in the price, were in response to information about IAS. The far more likely conclusion is simply that the price history of IAS [stock] was volatile. [Defendants' expert] calculated the standard deviation of IAS's stock return, a widely-used measure of volatility, and found it to be 13%, which he concluded was 'relatively high.' Consideration of all the evidence on this factor does not support a finding of an efficient market.[91]

Finally, the court in *Krogman v. Sterritt*,[92] considered both the *Cammer* factors and several others in denying the plaintiffs' motion for class certification.[93] The court found several factors weighed against finding an efficient market for the defendant's stock, including a low weekly trading market, a limited number of analysts following such stock, and a failure by the plaintiffs to sufficiently demonstrate a relationship between the defendants' stock's price movements and news disclosures.[94]

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[89] *Id.*

[90] *Id.* at 422–23.

[91] *Id.* at 423 (internal citations omitted).

[92] 202 F.R.D. 467 (N.D. Tex. 2001).

[93] *Id.* at 474–78, 480.

[94] *Id.* at 475, 477. As to the price reaction of the defendants' stock, the defendants' expert "calculated the standard deviation of [the defendant's] stock return, a widely used measure of volatility, and found the median standard deviation for weekly trading . . . . to be twelve percent, which he concluded was highly variable" and based upon this evidence, he found "very little relationship

In addition, the court noted that economic theory includes other possibly relevant factors for determining whether a stock trades in an efficient market, including market capitalization, bid-ask spread, and float.[95]

c. Market Capitalization

The *Krogman* court stated that "[m]arket capitalization . . . may be an indicator of market efficiency because there is a greater incentive for stock purchasers to invest in more highly capitalized corporations."[96]

The defendant's expert found that the market capitalization of the defendant was in the top sixty percent of a sample group.[97] Thus, the court found that this factor "weigh[ed] slightly in favor of a determination of market efficiency."[98]

d. Bid-Ask Spread

The court noted that the bid-ask spread is "the difference between the price at which investors are willing to buy the stock and the price at which current stockholders are willing to sell their shares. A large bid-ask spread is indicative of an inefficient market, because it suggests that the stock is too expensive to trade."[99] On this point, the defendant's expert concluded that the defendant's stock "had a median bid-ask spread of approximately 5.6% of its closing price, [which was] in the highest quartile of the sample used in his study."[100] The court found that the bid-ask spread tends to indicate an inefficient market.[101]

e. Float

The *Krogman* court also found that, because of the defendant's relatively low float—"the percentage of shares held

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between information and [the defendants'] stock price movements." *Id.* at 477 n.13 (internal citations and quotes omitted).

95 *Id.* at 477–478.

96 *Id.* at 478.

97 *Id.*

98 *Id.*

99 *Id.*

100 *Id.*

101 *Id.*

by the public"—this factor disfavored a finding of market efficiency.[102]

D. *Recapping* Cammer*'s Progeny*

What can *Cammer*'s progeny tell us in terms of the consistency of the federal district courts' analysis of market efficiency and the ultimate factors which are crucial to any market efficiency determination? Unfortunately, the answer may be, "not much."

Depending on which approach a court takes, and the procedural posture of the particular case, most courts will come to very individual conclusions concerning whether a particular stock traded in an efficient manner. Some courts place weight on the existence of market makers, while others do not. Again, while some courts place great weight on the weekly trading volume of a stock, other courts gloss over this factor or defer it to another day. Finally, some courts give great weight to a showing that there is a cause and effect relationship between the announcement of company-specific news and the price of a particular stock. On the other hand, some courts, despite some evidence of a cause and effect relationship, find it important to understand whether or not the stock fluctuated or behaved in a volatile manner. The lack of readily definable factors that might show market efficiency has truly created a massive hodgepodge of cases and outcomes.

Given this disparity in how courts view market efficiency, it is no wonder that many plaintiffs and defendants are at a loss when it comes to establishing or rebutting the fraud on the market theory's presumption of reliance. Perhaps what is needed is a return to the basics.

III. EFFICIENT MARKETS PARADIGM FOUND AND LOST

A. *Efficient Markets in Theory*

The concept of the Efficient Markets Hypothesis (EMH) is generally traced back to a 1970 academic article by Eugene F. Fama.[103] An efficient market is defined as one in which all

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[102] *Id.*

[103] *See* Eugene F. Fama, *Efficient Capital Markets: A Review of Theory and Empirical Work*, 25 J. FIN. 383 (1970).

information of a certain type is quickly and properly incorporated into stock prices.[104] The most sweeping version of the EMH is the strong form, which argues that all information, public and private, would be incorporated into stock prices.[105] This version is generally held not to be true,[106] and, if it were, insiders trading on private information would not be expected to do better than the average market participant since that information would already be incorporated into the stock price.[107] The next version is the semi-strong form, which posits that all public information is incorporated into stock prices.[108] The final version is the weak form, which posits that all previous stock prices, which are necessarily a subset of all public information, are already incorporated into current stock prices.[109]

The main implication of the EMH, when it holds, is that an investor cannot earn an above-average return by using stale or previously known information. For example, if some information entered the market on Monday at 2 p.m., the effects of that information would be fully incorporated into the stock price immediately thereafter (or, at the least as quickly as the market can process the information).[110] The information would tell the market nothing about future stock price changes.[111] Consider the following scenario: suppose that it was well accepted that the Monday announcement caused a stock to rise from $20 to $25 and that somehow the general market belief for the next day or

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[104] *See id.* at 383, 409–413.

[105] *See id.*

[106] *See id.* at 409–410.

[107] Thus, it is implicit in relevant statutory law and court decisions finding liability for insider trading that both legislatures and courts reject strong form efficiency. *See* Jonathan R. Macey & Geoffrey P. Miller, *Good Finance, Bad Economics: An Analysis of the Fraud-on-the-Market Theory*, 42 STAN. L. REV. 1059, 1078–79 (1990) (noting that the Supreme Court has "unambiguously rejected the strong form").

[108] *See* Fama, *supra* note 103, at 383.

[109] *See id.*

[110] Some EMH purists would argue that much of the incorporation occurs within five or ten minutes after an announcement. *See, e.g.*, James M. Patell & Mark A. Wolfson, *The Intraday Speed of Adjustment of Stock Prices to Earnings and Dividend Announcements*, 13 J. FIN. ECON. 223 (1984) (discussing the behavior of stock prices throughout the day and how this behavior is affected by earnings and dividend announcements).

[111] Technically, the information would say nothing about the average level of future stock price changes. Certainly some information, such as that a company will hear about whether it is awarded a large government contract in a week, will provide information about future volatility.

so was that this information would cause the stock to rise to $30 by Thursday. In that case, it is necessary to ask which holders of the stock are so desperate for cash that they are selling the stock at $25 when it will go up 20% in the next three days? Or, suppose that someone claims that the rise from $20 to $25 would have to be reversed in the next three days. If that were a generally accepted belief, one would have to seriously question what type of investor would actually be buying the stock at $25 if it was going to go down to $20 in the near future. Put simply, once information has been provided to the market, the market as a whole simply cannot expect that information to have an additional effect on a stock at a later point in time; instead, all the effects of the information have to be incorporated into the stock price immediately. If this were not the case, the market would have to have a lot of desperate sellers or completely foolish purchasers.

Of course, there are some irrational market participants, though not necessarily as foolish as those described above. It is in how these irrational investors are treated that is one of the main distinguishing features between the strongest advocates of the EMH and proponents of contrary theories that have become the grist of behavioral finance.

Advocates of the EMH recognized that not all investors are rational, but also pointed to three mechanisms that they felt would ensure that the non-rational investors' influence on markets would be minimal. *First*, while there is one way to be rational, there are numerous ways to be irrational. Therefore, the argument goes, there should be roughly as many irrational investors putting in ill-considered purchase orders for a stock as putting in ill-considered sell orders for that stock. On average, these random pressures on a stock would tend to cancel out. *Second*, in those cases where the irrational traders' behavior did not cancel out, perhaps due to chance, rational investors would take advantage of the opportunity to make a profit. To take an extreme example, suppose that a company was going to liquidate itself tomorrow and pay out $20 per share in proceeds per share outstanding. Putting aside tax considerations, it is clear that the share price should be $20 today. If irrational investors really wanted to sell this stock and pushed the price down to $19, rational investors would be more than happy to come in and buy up all the outstanding shares at $19 and make a quick $1

profit.[112] In fact, the rational investors would not wait for the price to drop much below $20 and would quickly push it back up to that level as they overwhelmed the small group of irrational investors who by chance happened to be selling the stock. *Third*, to the extent that the irrational investors do succeed in pushing this stock price down to $19, they have lost a dollar in value that they otherwise would have had by not trying to sell. Advocates of the EMH argued that over the long run, irrational investors could only lose money by picking the wrong prices. Thus, either the irrational investors would have no effect on stock prices, or they would wind up losing money in their trades and remain restricted to being a very minor force in the market as they either become impoverished or realize that playing the stock market is not for them.

B. *The Correspondence Between the Academic Efficient Markets Definition and the Courts' Decisions of Whether a Market Is Efficient*

Evidence of market efficiency usually focuses on the *conditions* under which the Efficient Market Hypothesis holds and whether the defendant's security (subjectively) meets these conditions. Neither the *definition* nor the *acceptance* of market efficiency have been raised as issues in the bulk of legal academic literature.[113]

The traditional view is that the possibility of arbitrage results in market efficiency. Specifically, an efficient market is assumed to arise when: (1) securities are auctioned in an honest and competitive manner among investors; (2) transaction costs

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[112] More generally, the rational investors might go long the individual stock and short an index, or vice versa, so that they would profit when the stock price returned to its "proper" level relative to the index. This type of hedging is done to help protect arbitrageurs against broad industry or market movements, which would tend to cancel out by being long (short) a stock and short (long) an index of similar stocks.

[113] The initial law review article on the subject was *The Measure of Damages in Rule 10b-5 Cases Involving Actively Traded Securities*, 26 STAN. L. REV. 371, 371, 394–95 (1974) (attempting "to determine an appropriate measure of damages in [r]ule 10b-5 suits brought by parties claiming injury from market transactions in an actively traded stock"). At that time, the definition of efficient markets was in its formative stages. *See* Fama, *supra* note 103, at 383–85, 387–88; Eugene F. Fama et al., *The Adjustment of Stock Prices to New Information*, 10 INT'L ECON. REV. 1, 1 (1969). Later articles cited the more developed formulation in Eugene Fama's textbook. *See* EUGENE F. FAMA, FOUNDATIONS OF FINANCE 133–37 (1976).

are small (for both long and short positions); and (3) there are a large number of sophisticated investors with access to public information.[114] These conditions are presumed to foster equilibrium securities prices that respond rapidly and rationally to new public information.

As we noted above in our discussion of *Cammer v. Bloom*, in securities litigation, objective evidence with subjective guidelines is usually presented to support a claim that the market is efficient.[115] The purpose of presenting such data is to determine whether there are large numbers of sophisticated, informed buyers and sellers who are in competition with each other to extract the best return from their trading. *Cammer,* however, focused primarily on the volume of trading and the number of traders,[116] rather than the cost of trading and the sophistication of investors. *Krogman* improved on this reasoning by also focusing on transaction costs like bid-ask spreads and float.[117] Nevertheless, there is room for further improvement. It is not enough that there are low transactions costs for long positions—arbitrageurs may have to go short to drive prices to fundamental value. Furthermore, the presence of many investors is not evidence that the "right" kind of investors are trading, that is, investors who can use risky arbitrage if prices get out of line with value. Since many mutual funds and pensions are prohibited by law from taking short positions, one should not assume that many investors is synonymous with means many sophisticated investors.

The problem with this type of evidence is that, with the possible exception of how the stock price responds to news, it does not show directly whether the market is efficient or that the security itself is priced efficiently.[118] In other words, courts have

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[114] *See* RICHARD A. BREALEY & STUART C. MYERS, PRINCIPLES OF CORPORATE FINANCE 285, 298 (1988); *see also* JONATHAN E. INGERSOLL, JR., THEORY OF FINANCIAL DECISION MAKING 54, 73 (1987); Ray Ball, *What Do We Know About Stock Market Efficiency?*, *in* A REAPPRAISAL OF THE EFFICIENCY OF FINANCIAL MARKETS 51 (Rui M. C. Guimaraes et al. eds., 1989).

[115] *See* Aff. of Norman Poser, Cammer v. Bloom, 711 F. Supp. 1264 (D.N.J. 1989); *see also* Binder v. Gillespie, 184 F.3d 1059, 1064–65 (9th Cir. 1999); *Cammer*, 711 F. Supp. at 1285–87.

[116] *See Cammer*, 711 F. Supp. at 1285–87.

[117] *See* Krogman v. Sterritt, 202 F.R.D. 467, 478 (N.D. Tex. 2001) (finding that the relatively high bid-ask spread and relatively low float of the stock both indicated market inefficiency).

[118] When EMH was ascendant in the courts, the controversies in the economics

focused mostly on the preconditions for market efficiency, but have often downplayed the behavior or performance of the security's price. As will be shown, even as the courts were establishing these criteria, academic research was showing that they were possibly necessary, but certainly not sufficient, conditions to prove that a stock traded in an efficient manner.

C. *Challenges to the Efficient Market Hypothesis*

1. The Empirical Status of the Efficient Market Hypothesis After *Basic*

The EMH reached its peak of respectability in the courts in response to the *Basic* decision during the mid-1990s when, ironically, it was facing a difficult challenge in the academic literature. Stock market efficiency was no longer a presumption among economists. Since the mid-1980s, empirical literature had been finding stock market anomalies at an astounding pace.[119]

a. The Volatility Puzzle

The first results of interest occurred several years after the fraud on the market theory had been proposed in the legal literature and had been accepted in some circuits. LeRoy/Porter and Shiller, two sets of authors working independently, attempted to show stock return volatility was higher than predicted by the efficient market model.[120]

These results cast doubt on whether stock prices accurately reflect available information. Under the efficient market model, today's stock price equals the expected present discounted value

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literature over whether and how informationally efficient markets can be defined had been largely ignored. *See* Ball, *supra* note 114, at 26–55.

[119] *See* Eric C. Chang & J. Michael Pinegar, *Seasonal Fluctuations in Industrial Production and Stock Market Seasonals*, 24 J. FIN. & QUANTITATIVE ANALYSIS 59, 59 (1989) ("Many researchers document stock market anomalies that challenge the efficient markets hypothesis.").

[120] *See* Stephen F. LeRoy & Richard D. Porter, *The Present-Value Relation: Tests Based on Implied Variance Bounds*, 49 ECONOMETRICA 555, 558 (1981) ("We see that based on both aggregated and disaggregated data, stock prices appear to be more volatile than is consistent with the efficient capital markets model."). *See generally* Robert J. Shiller, *Do Stock Prices Move Too Much to Be Justified by Subsequent Changes in Dividends?* 71 AM. ECON. REV. 421, 421–36 (1981) (suggesting that stock prices are too volatile to accord with the efficient market model).

of all future dividends.[121] Research showed that stock prices are more volatile than can be explained by this model. Therefore, it followed that stock prices are based on factors other than or in addition to information about future dividends, i.e., factors besides fundamental value.

In response to various critiques, Campbell and Shiller solidified the econometrics of these findings, but left an important conceptual issue in doubt: these volatility tests were actually testing, at the same time, a number of hypotheses of which market efficiency is only one.[122] That is, securities markets could be efficient and Campbell and Shiller could have still found higher-than-expected volatility. Some other assumptions about the market, such as the behavior of discount rates, could have been wrong. If this were the only research to cast doubt on efficient markets, then there would still not have been much reason to question the fraud-on-the-market-theory.

b. Price Overreaction and Underreaction

Another set of empirical results of importance for the fraud-on-the-market theory was in literature on price overreaction, which is more directly related to the central issues in a 10b-5 class action.[123] First, this literature involved the behavior of

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[121] *See* Stephen F. LeRoy, *Efficient Capital Markets and Martingales*, 27 J. ECON. LITERATURE 1583, 1584 (1989). This was originally shown for futures markets. *See* Paul A. Samuelson, *Proof That Properly Anticipated Prices Fluctuate Randomly*, 6 INDUS. MGMT. REV. 41, 41–49 (1965). Samuelson then restated the result for stock prices and, recently, applied the same concept to land prices. For the stock price version, see Paul A. Samuelson, *Proof That Properly Discounted Present Values of Assets Vibrate Randomly*, 4 BELL J. ECON. & MGMT. SCI. 369, 369–74 (1973).

[122] There were several econometric critiques, but the most important article was probably Robert C. Merton, *On the Current State of the Stock Market Rationality Hypothesis*, *in* MACROECONOMICS AND FINANCE: ESSAYS IN HONOR OF FRANCO MODIGLIANI, (Stanley Fischer et al. eds., 1987). *See generally* John Y. Campbell and Robert J. Shiller, *The Dividend-Price Ratio and Expectations of Future Dividends and Discount Factors*, *in* REVIEW OF FINANCIAL STUDIES 195–228 (Michael Brennan ed., 1988). Several authors have commented on the problem of joint hypothesis tests when attempts are made to test the efficient markets hypothesis. *See* Eugene F. Fama, *Efficient Capital Markets: II*, 46 J. FIN., 1575, 1575–1617 (1991) [hereinafter *Efficient Capital Markets II*]("Ambiguity about information and trading costs is not . . . the main obstacle to inferences about market efficiency. The joint-hypothesis problem is more serious.").

[123] *See, e.g.*, Roni Michaely et al., *Price Reactions to Dividend Initiations and Ommissions: Overreaction or Drift?*, 50 J. FIN. 573, 574 (1995) (discussing studies regarding price performance following overreaction by the market).

stock prices after a steep decline as might happen, say, when there is an alleged corrective disclosure. Second, the overreaction literature used a technique, called the event study, that avoided some of the problems encountered by the other tests of market efficiency.[124] The event study methodology has been suggested in the legal literature to determine materiality and estimate damages in securities cases.[125]

It is useful to divide the overreaction literature into long-run and short-run price reaction studies. The long-run studies created portfolios of "losers"—stocks whose past performance has been near the bottom—and tested whether these portfolios outperform the market. These studies typically examined monthly returns over long, e.g., three-year, time horizons. The initial studies, associated with DeBondt and Thaler, showed that such portfolios did outperform the market.[126] These results were consistent with the findings of mean reversion described above. A series of articles by Chan and Zarowin, however, showed that these results might also be explained by changes in the risk of the portfolios or by the well-known size[127] and January[128] effects on stock returns.[129]

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[124] *See Efficient Capital Markets II*, *supra* note 122, at 1602 ("Event studies are the cleanest evidence we have on efficiency (the least encumbered by the joint-hypothesis problem).").

[125] *See In re* Seagate Technology II Sec. Litig., 843 F. Supp. 1341 (N.D.Cal. 1994). There, the court accepted some of defendants' event studies and dismissed certain claims on that basis, but ruled that defendants' other event studies were inadequate and denied their request for summary judgment with regard to those issues. The court also found plaintiffs' event studies lacking and therefore denied a cross-motion for summary judgment. *Id.* at 1368; *see also In re* Executive Telecard, Ltd. Sec. Litig., 979 F. Supp 1021, 1025–27 (S.D.N.Y. 1997) (ruling that expert witness's testimony was inadmissible for failure to conduct an event study); Goldkrantz v. Griffin, No. 97 CIV. 9075, 1999 U.S. Dist. LEXIS 4445, at *13–15 (S.D.N.Y. Apr. 6, 1999) (granting summary judgment based on plaintiffs' failure to contest defendants' event study analysis).

[126] *See* Werner F. M. De Bondt & Richard Thaler, *Does the Stock Market Overreact?*, 40 J. FIN., 793, 799 (1985); Werner F. M. De Bondt & Richard H. Thaler, *Further Evidence on Investor Overreaction and Stock Market Seasonality*, 42 J. FIN., 557, 571 (1987).

[127] The size effect refers to the then well-known statistical fact that returns to portfolios of small firm stocks are greater than returns to portfolios of large firm stocks.

[128] The January effect refers to the then well-known statistical fact that returns during the typical January are higher than returns in other months.

[129] *See* K. C. Chan, *On the Contrarian Investment Strategy*, 61 J. BUS. 147, 148 (1988) (proposing that "the risks of winner and loser stocks are not constant over time"); Paul Zarowin, *Does the Stock Market Overreact to Corporate Earnings*

The results based on short-term periods, i.e., usually daily returns over the period of a month or more, have provided evidence of both overreaction and underreaction. For example, Zarowin, in the last of the series of his articles, showed significant daily price overreaction (return reversals) within one month.[130] These results still obtained after controlling for the size and January effects. Also important was the work of Bremer and Sweeney who found that if a stock price drops, say, 10 percent on any given day, then it can be expected to retrace a market-adjusted 6 percent of its price (60 percent of the price drop) over the next 29 trading days.[131] This result occurred even after adjusting for reasonable variations in risk. These two research efforts were consistent with other findings that stocks with abnormal one day returns reversed direction in subsequent days.[132] They were also consistent with the results of Lehmann, who showed that an arbitrage strategy of buying losers and selling winners each week will net substantial short-run profits even after accounting for transaction costs.[133] On the other hand, some studies of stock price reactions to news such as earnings announcements provided evidence that stocks had an initial reaction to an announcement and then kept moving in that same direction for several weeks.[134] This underreaction phenomenon is not limited simply to news events, but was also noted in

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Information? 44 J. FIN. 1385, 1386 (1989) (suggesting that "the overreaction to earnings phenomenon is another manifestation of the size phenomenon"); Paul Zarowin, *Size, Seasonality and Stock Market Overreaction*, 25 J. FIN. & QUANTITATIVE ANALYSIS 113, 115 (1990) (finding that "differential size, and not investor overreaction, is driving the winner versus loser phenomenon, and that a widely regarded efficient markets anomaly is subsumed by the size and seasonal phenomena").

[130] *See* Paul Zarowin, *Short-run Market Overreaction: Size and Seasonality Effects*, 15 J. PORTFOLIO MGMT. 26, 26–29 (1989).

[131] M. Bremer & Richard Sweeney, *The Information Content of Extreme Daily Rates of Return*, Claremont, Sept. 25, 1987.

[132] E. A. Dyl & K. Maxfield, *Does the Stock Market Overreact? Additional Evidence*, University of Arizona, June, 1987. K. C. Brown et al., *Risk Aversion, Uncertain Information, and Market Efficiency*, University of Texas, Austin, Jan. 1988.

[133] *See* Bruce N. Lehmann, *Fads, Martingales, and Market Efficiency*, 105 Q. J. ECON. 1, 12–25 (1990).

[134] *See, e.g.*, Victor L. Bernard, *Stock Price Reactions to Earnings Announcements: A Summary of Recent Anomalous Evidence and Possible Explanations*, *in* ADVANCES IN BEHAVIORAL FINANCE 303, 305 (Richard H. Thaler ed.,1993) (reviewing research "consistent with the initial reaction being (on average) too small, and being completed over a period of at least six months").

studies of stocks grouped according to how well they did relative to the market over a short-term horizon.[135] Underreaction has also been found in response to dividend initiations and omissions,[136] as well as share repurchases.[137] The overall evidence on short-term overreaction or underreaction is somewhat uncertain, with different studies providing apparently contradictory results, though most financial economists now accept that one may diverge from the predictions of the EMH in different ways, depending on the particular circumstances being studied.

2. Theoretical Challenges Upset the EMH

In light of the empirical findings even before the stock market bubble of the 1990s, economists looked to new theories from the developing field of behavioral finance.[138] Many of the theoretical challenges to the EMH dealt with how the irrational traders actually behaved. While advocates of the EMH assumed that there would be a variety of irrational behaviors that would on net roughly cancel each other out, psychologists and academics from behavioral finance were investigating whether there were systematic ways in which people, including investors, deviated from the postulates of rational behavior.

a. Loss Aversion

One of these deviations, which we use here as an example, is referred to as "loss aversion," meaning literally that people don't like to suffer or recognize a loss. Suppose that an investor purchased two stocks for $100 each and one has gone up in value

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[135] *See, e.g.*, Narasimhan Jegadeesh & Sheridan Titman, *Returns to Buying Winners and Selling Losers: Implications for Stock Market Efficiency*, 48 J. FIN. 65, 68–89 (1993) (documenting the short-term effects of strategies that buy stocks that performed well in the past and sell stocks that faired poorly in the past).

[136] *See* Roni Michaely et al., *Price Reactions to Dividend Initiations and Omissions: Overreaction or Drift?* 50 J. FIN. 573, 582–605 (1995) (discussing short-term market reactions to both initiations and omissions of cash dividend payments).

[137] David Ikenberry et al., *Market Underreaction to Open Market Share Repurchases*, NBER Working Paper No. W4965, Dec. 1994, at 2–3 (noting that "market trends repurchase announcements with skepticism, leading prices to adjust slowly over time" and referring to the phenomenon as the "Underreaction Hypothesis").

[138] *See, e.g*, ANDREI SHLEIFER, INEFFICIENT MARKETS: AN INTRODUCTION TO BEHAVIORAL FINANCE 1–10, 112–14 (2000) (providing more detail on many of the discussion points here).

and one has gone down. If the investor wants to sell some of her portfolio, which should she sell? Under the EMH, past price movements say nothing about future movements, so the "winner" stock is no more likely to go up in the future than the loser. The main reason to sell the winner stock is to diversify the portfolio, since by going up in value the winner stock is now a larger share of the portfolio's overall value; the main reason to sell the loser stock is because selling the winner results in an immediate tax liability, whereas selling the loser stock first saves at least on the time value of the tax liability. Investor behavior was evaluated by examinations of actual trading data and through experiments in which investors were presented with hypothetical portfolios. After controlling for the various reasons, to sell one stock or another, economists determined that investors were overly reluctant to sell their losing stocks and recognize the loss. For the EMH, the important consequence was that this would not be a random deviation from rational behavior that would cause some investors to buy a stock and others to sell; when a stock went down in value, that would cause the overwhelming majority of irrational investors to refuse to sell. Similarly, when a stock went up in value, that should cause an overwhelming majority of irrational investors to become inclined to sell that stock relative to their other holdings.[139]

b. Constraints on Arbitrage

A second part of the theoretical challenge to the EMH was whether rational investors would indeed intervene sufficiently to counter the effects of irrational traders' behavior. The response here may be summed up in the statement by John Maynard Keynes that "markets can remain irrational longer than you can remain solvent."[140] In other words, , there is a real risk in following a strategy that will pay off in the long run, once the firm's cash flows come true and investors achieve the value they estimated in setting the market price, if investors face the chance that they will lose more money and face the possibility that they will have to liquidate their positions before then. In

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[139] See Terrance Odean, *Are Investors Reluctant to Realize Their Losses?*, 53 J. FIN. 1775, 1781–95 (1998).

[140] Justin Fox, *Is the Market Rational?*, FORTUNE, Dec. 9, 2002, at 126.

the context of the Internet bubble, if an investor shorted $100 worth of the Nasdaq Composite Index on December 6, 1996, the day of Alan Greenspan's speech about irrational exuberance, then on March 10, 2000, the day the Nasdaq peaked, her portfolio would have declined in value from a positive value of $100 to a negative position of $292, or a loss of $392.

c. Irrational Investors Have Staying Power

Finally, there is the question of whether irrational investors would be driven from the market by their poor performance. The main response from behavioral economists again focuses on risk, but this time it is a trade-off between risk and reward. If irrational investors are taking undue risks, then they may on average be rewarded with above-average returns. While not all irrational investment strategies do result in an expected above-average return, this argument at least makes it unclear whether on net the irrational traders would tend to be driven out of the market or in fact gain in prominence over time.

3. Other Behavioral Finance Challenges

Loss aversion is not the only theoretical challenge to the EMH. Some of the other areas of systematic deviation from rational behavior that psychologists and behavioral finance economists have documented include the following:

- Extrapolative expectations: the concept that people often predict the future by projecting the recent past forward.[141] Therefore, if a stock or the market has been going up recently, market participants are likely to assume that it will keep going up in the future, even if the recent run-up is due to chance.
- Representativeness: the tendency for people to try to understand a phenomenon by comparing it to a similar case that they are familiar with, as opposed to

[141] *See, e.g.*, Karl E. Case & Robert J. Shiller, *The Behavior of Home Buyers in Boom and Post-Boom Markets*, *in* MARKET VOLATILITY 403–429 (Robert J. Shiller ed., 1989); Jeffrey A. Frankel & Kenneth A. Froot, *Explaining the Demand for Dollars: International Rates of Return, and the Expectations of Chartists and Fundamentalists*, *in* MACROECONOMICS, AGRICULTURE, AND EXCHANGE RATES (Philip L. Paarlberg & Robert G. Chambers eds., 1988) (addressing studies on such behavior).

understanding the relative probabilities of the two cases.[142]

- Conservatism: the tendency for people to anchor their beliefs to old ideas for an inappropriately long period of time before changing their beliefs when presented with new evidence.[143]
- Optimism and overconfidence: Most investors think they are above average. Overconfidence increases trading volume.[144] It also causes investors to ignore the information contained in other people's trades, which can cause overreaction in stock prices.[145]
- Memory biases in estimating frequencies: One rule of thumb people use to estimate frequency is the ease of recalling examples. This makes people overestimate the frequency of vivid events like plane crashes, murders—or an Internet stocks doubling in a week.[146]

4. A "Rational" Challenge to the EMH

Even advocates of rational investor behavior have presented an argument why a stock price may incorporate all publicly available information, and generally behave in an efficient manner, but still not represent the true value of the underlying company. This theory, known as "rational bubbles," can be presented as follows.[147] Suppose that on top of the true value of a stock, one day the price is a dollar too high. Normally, investors would want to sell the stock because the dollar will

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[142] *See, e.g.*, SHLEIFER, *supra* note 138, at 113; Amos Tversky & Daniel Kahneman, *Judgment Under Uncertainty: Heuristics and Biases*, *in* JUDGMENT UNDER UNCERTAINTY: HEURISTICS AND BIASES 3–20 (Daniel Kahneman et al. eds., 1982).

[143] *See* Ward Edwards, *Conservatism in Human Information Processing*, *in* FORMAL REPRESENTATION OF HUMAN JUDGMENT 17–18 (Benjamin Kleinmuntz ed., 1968).

[144] *See, e.g.*, Terrance Odean, *Do Investors Trade Too Much?*, 89 AM. ECON. REV. 1279, 1280–92 (1999) (discussing overconfidence as one factor leading to increased trading volume).

[145] *See, e.g.*, Kent Daniel et al., *Investor Psychology and Security Market Under- and Over-Reactions*, 53 J. FIN. 1839, 1844–55 (1998).

[146] *See* generally B.A. Mellers et al., *Judgment and Decision Making*, 49 ANN. REV. PSYCHOL. 447 (1998) (explaining the various theories regarding judgmental errors and biases).

[147] Oliver J. Blanchard & Mark W. Watson, *Bulles, Anticipations Tationnelles et Marches Financiers, (Bubbles, Rational Expectations, and Financial Markets)*, *in* ANNALES DE L'INSEE (1984).

quickly be arbitraged away. On the other hand, suppose that the reason the price is a dollar too high today is because there is a fifty percent chance that the price will be two dollars too high next year and a fifty percent chance that the price will revert back to the true value next year. If an investor is risk neutral, or if the risk of the bubble bursting is independent of market risk, then this is a fair investment because the expected gains equal the expected losses.[148] The next question is how the stock price could be two dollars too high next year. This is possible if, once it reaches the price of two dollars above fundamental value next year, there is a fifty percent chance that the price falls back to fundamental value the following year and a fifty percent chance that the bubble again doubles to four dollars above fundamental value. In fact, as long as the security is potentially infinitely-lived like a stock (as opposed to a bond with a fixed maturity date), a rational bubble can be theoretically sustained. Moreover, there is no reason for rational investors to avoid the stock or to try to arbitrage away the overvalued price. Eventually the bubble will burst of course, but it is always a fair investment until that point. During the period when the stock is a fair investment, the fundamental value part of the stock price can move up and down as new information about the company becomes available.

This brings up the fact that there are really two commonly-used definitions of an "efficient market." The traditional definition is that the market incorporates all news. It was generally assumed that this definition implied that a security's price reflected the market's perception of the fundamental value of the cash flows to which the security had a claim; however, as the theory of rational bubbles shows, the stock price can incorporate all information about a company but still not reflect its fundamental value. A second definition, and the one that forms the basis for many statistical tests of market efficiency, is that one cannot make supernormal profits by trading the stock to exploit an inefficiency in its pricing behavior. If you knew that a certain stock doubled in price every Tuesday, you could buy it at the close on Monday and sell it at the Tuesday close and earn a tremendous return on your investment even after

[148] The same example can be used for risk-averse investors by simply having the growth of the bubble be larger than one hundred percent per year.

considering the transaction costs. However, with a rational bubble, an investor is as likely to gain or lose money and therefore cannot exploit the mispricing of the stock to make a profit.

Recent theoretical models and empirical evidence on hedge fund holdings have found that rational arbitrageurs may profit more from riding a bubble than trying to pop it.[149] While coordinated action by arbitrageurs could burst a bubble, competitive pressures make coordination difficult or even undesirable. If arbitrageurs learn sequentially that a bubble exists, they may not know what other arbitrageurs know. Thus, this coordination challenge and sequence of discovery can make it profitable for arbitrageurs to contribute to the bubble until they think it is about to burst. Stanley Druckenmiller, the manager of George Soros's eight billion dollar Quantum fund, explained that although he realized the exaggerated value of technology stocks, yet he held on to them because he still believed that the bubble was not over.[150] Recent studies of hedge funds have supported this theory: hedge funds held significant long positions in technology stocks throughout the Internet bubble, typically dumping them just one quarter before each individual stock crashed.[151]

IV. ECONOMIC PROOF IN FRAUD-ON-THE-MARKET CASES IN THE ABSENCE OF THE EMH

What are the implications of these findings on 10b-5 class actions? It is clear that the presumption of efficient markets is no longer universally held in the economics profession. Reputable academics are found on both sides of the debate, with the leading opponents of the EMH promoting a theory that stock prices can be affected by speculative bubbles, overreactions, and underreactions in addition to fundamental information.

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[149] *See* Julian Marshall, *Hedge Funds: The New Investment Bubble? The Happy Solution to Volatile Equity Markets or an Accident Waiting to Happen?*, EUROMONEY, Jan. 1, 2002, at 102 (discussing the benefits and drawbacks of hedge fund investments).

[150] Dilip Abreu & Markus Brunnermeier, *Bubbles and Crashes*, 71 ECONOMETRICA 173, 175 (2003). Druckenmiller remarked that "[w]e thought it was the eighth inning, and it was the ninth." *Id.*

[151] *See* M. Brunnermeier & S. Nagel, *Arbitrage at its Limits: Hedge Funds and the Technology Bubble*, Princeton University Working Paper, Nov. 2002.

A. What Needs to be Shown

The EMH allowed a court to rely on the rebuttable presumption that if stocks traded in an efficient market, then investors could rely on the stock price to accurately incorporate all publicly available information. This greatly simplified plaintiffs' burden in proving reliance for the members of a proposed class. In particular, individual plaintiffs would not have to prove that they saw the particular misstated piece of information or that they read the document that should have contained some omitted information. By relying on the EMH, individual investors could be said to be implicitly trading in reliance on the stock price to incorporate all public information.

On the other hand, if the EMH is not true, then even rational investors would have reasons to trade that were not just unrelated to the underlying fundamental value of a company, but even in spite of known deviations of the price from that fundamental value. For example, under one theory, uninformed ("noise") traders establish a trend that is rational for the informed traders to follow. Such positive feedback trading by the informed traders is not based on fundamentals or on reliance on the integrity of the market.[152] Consequently, the presumption that investors can or do rely on the integrity of the market, if integrity implies that the market is semi-strong efficient, is then misplaced. Reliance may be more on the trends in the stock and on the beliefs of uninformed investors.

Moreover, the findings reported above imply that stock prices are not always based on fundamental value. Summers has shown that even barely detectable failures in the efficient market model can lead over the long run to prices exceeding their fundamental values by thirty percent under reasonable values for the parameters of his model.[153] This would reinforce the conclusion that there is not always a justifiable presumption that investors can or do rely on the integrity of market where that concept is taken to mean the property that stock prices accurately reflect available information. It also means that, in securities litigation, individual stocks should be analyzed on a

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[152] *See* J. Bradford DeLong et al., *Positive Feedback Investment Strategies and Destabilizing Rational Expectations*, 45 J. FIN. 379, 380 (1990).

[153] *See generally* Lawrence H. Summers, *Does the Stock Market Rationally Reflect Fundamental Values?*, 41 J. FIN. 591 (1986).

case-by-case basis as opposed to an indiscriminate invocation of the efficient market hypothesis.

If, for example, the positive feedback trading strategy is an explanation of the performance of a defendant's share price, then the defendant may not be liable for most of the inflation in the stock price.[154] When the stock price is inflated during the class period by a speculative bubble that is pierced by a corrective disclosure, then there has been a contribution by investors, including plaintiffs, to the investment losses. The positive feedback trading causing or compounding price inflation is beyond the control of the defendant, and thus represents a loss that would have occurred at some point when the bubble eventually burst. Thus, the elements of both causation and damages are affected by the behavior of investors during the class period.

B. Market Efficiency Diagnostics Based on Stock Price Behavior

1. Bubbles and Overreaction

One of the simplest sets of tests for whether a stock behaved in an efficient manner would include inspection of the stock price patterns over the class period to see whether fad and overreaction elements are present. More rigorous testing would include statistical estimates of the autocorrelation structure, an examination of the variance of returns over time, and various assessments of whether there has been overreaction or underreaction in either price increases or price decreases.

These tests would then provide evidence on whether the stock in question blatantly violated the premises of the EMH. However, they still do not provide evidence that the stock is

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[154] There is no statutory formula for the measurement of 10b-5 damages, though 10b-5 damages are limited through the "bounce-back" provision of the 1995 Private Securities Litigation Reform Act. Nevertheless, the most common measure of damages is the "out-of-pocket" measure, under which inflation is measured as the difference between the amount paid for a security and its true value; damages equal the inflation on purchase less any inflation on sale. Implicit in this definition is that defendants are responsible for the inflation. However, if a stock's trading price can differ from its true value based on fundamentals for reasons other than defendants' actions, then the logical implication of the securities laws is that defendants are only responsible for the deviation from true value *due to* their fraudulent actions and not any deviation that would have occurred even if no fraud had been committed.

actually incorporating news. For example, consider the classic case of a "stock price" that is initially set at one hundred dollars and then set in motion by flipping a coin; whenever the coin turns up heads, the stock price is increased by one dollar and whenever the coin is tails, the price is moved down one dollar. Such a stock price series would behave perfectly randomly and not show statistical evidence of overreaction, underreaction, fads, or any other psychological phenomenon. However, that does not mean that the price incorporates any news. If, for example, it was announced that starting in ten flips, the coin would be replaced with another that had a bias towards heads, the "stock price" would not react until the new coin started to be used.

2. Price Reaction to News

What is needed, therefore, is a test that examines the response of the stock price to news even if it does not violate the basic assumptions of the EMH. Such a test distinguishes between efficiency as measured by an unpredictable stock price and one that incorporates all publicly available information.

In terms of the application of the EMH to securities class actions, an important question is whether any allegedly fraudulent information would cause a change in the issuer's stock price. However, because the market does not know (at the time) whether any information it receives is legitimate or fraudulent, this question can be answered by testing whether the market for a particular issuer's stock responds to news more generally. If it does, then one is more confident that the stock price would be affected by any material false information or would have responded to material omitted information. If the stock price does not generally respond to news, then the presumption should then become that the stock was not affected by any false news and may not have responded to allegedly omitted information.

Because stock prices move all the time, one must compare the movements in response to news stories with a control group of prices. One way to do this would be to look at a sample of days in a class period exclusive of those days alleged to be corrective disclosure(s) and perform a news search.[155] An

[155] The examination would exclude those days in which a corrective disclosure

alternative would be to look at a sample just before the class period. Using whatever sample is chosen, one could then separate out those days on which the company is mentioned in the news from those on which it is not. Of course there are various ways to implement this procedure. For example, there is the choice of news sources to be searched (e.g., major newspapers and presswires versus all available news sources), and whether to limit the search to those stories where the company name and/or ticker is mentioned in the headline, the headline and lead paragraph, or anywhere in the story. One could also refine the search to only focus on particular types of news stories (e.g., earnings announcements). In any case, one would still have to be careful to assign stories to the proper dates (i.e., stories after a market close could only affect the next day's stock price movements) and to remove any stories that exist because they report on a price movement.

The next step is to determine the abnormal or excess returns for the stock for each day in the sample period. This procedure is the same one that is now nearly universally used in measuring alleged damages; an analyst estimates a relationship between the issuer's stock price and a market and/or industry index, finds the excess price movement in the issuer's stock price relative to what is predicted by the index, and then determines whether that movement is statistically significant.[156]

The final step involves comparing the percentage of days with news that have a statistically significant price movement to the percentage of days without news that have a statistically significant price movement. For example, if seven percent of the days with news have statistically significant price movements and four percent of the days without news have statistically significant price movements, then the analyst would test whether the difference between the seven percent and the four percent is statistically significant. If it is, then the evidence would show that, on average, the defendant's stock price reacts to news announcements; if the difference is not statistically

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was made because plaintiffs would normally choose a class period where corrective disclosures coincide with large negative price movements; including those days in the analysis would bias the results.

[156] The most common choice for statistical significance is the 5% level, though this test of market efficiency can be done using any level of statistical significance.

significant, then there would be no basis for saying that the defendant's stock price is affected by news.

An example of the output of this type of test is shown below for the Metro Global Media securities litigation.

Metro Global Media, Inc.
Comparison of Significant Price Reactions on Days with News to Days with No News
September 13, 1996 through September 13, 1999

	Days with News			Days with No News			
	Total Number	Number with Significant Price Reaction	Percent Significant	Total Number	Number with Significant Price Reduction	Percent Significant	P-Value on Difference
			(2)/(1)			(5)/(4)	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
10% Significance Level	204	16	7.8%	551	40	7.3%	0.39
5% Significance Level	204	10	4.9%	551	22	4.0%	0.30

The table illustrates the price movements on the 755 trading days within the class period for Metro Global Media, Inc. For each day, we examined whether there was a news story about the company, excluding those stories that simply reported on prior price movements. We also examined whether the stock price movement on the day of the news story (or the next trading day if the story came out after trading ended) was statistically significant at either the 10% or the 5% significance level. Looking at the 10% level, we see that in 16 of 204 days with news stories, or 7.8% of the time, the stock price had a statistically significant movement associated with the news story. While this would seem to imply that the stock can react to news, the analysis on that row also shows that the stock had a similarly statistically significant movement on 7.3% of the days when there was no news story.[157] Column 7 of the table tests whether the difference between the 7.8% and 7.3% figures is statistically significant or could be due to chance alone. The reported p-value of 0.39 means that if we took two random samples of days without considering if there was news, then 39% of the time we would find a difference as large as that between the 7.8% and 7.3% values.[158] This result is far from the standard

[157] The fact that the latter figure does not equal 10%, as expected by theory, is an indication about the change in volatility of the stock and says nothing about whether it traded in an efficient manner.

[158] The test examines whether the means of two samples with potentially

5% level used in most tests of statistical significance. When we performed this same test using days that had an even larger statistically significant price movement, i.e., at the 5% level, then the difference in the number of days with a statistically significant price movement was larger (4.9% of the days with news versus 4.0% of the days without news), but still was not statistically significant at conventional levels.

While this test addresses the question of whether the stock responds to news, it does not answer the question about whether the response is of the correct magnitude. Therefore, this test is a threshold step, not a sufficient condition, to show that a stock traded in an efficient market. As discussed, passing this or most other tests of market efficiency only serves to show that the stock is responding to news and/or trading in a way in which one cannot earn a supernormal profit; the tests do not show that the stock price itself necessarily reflects the fundamental value of the underlying company.

3. Damages in the Absence of the EMH

The question of whether a stock trades in an efficient market goes not just to the issue of reliance, but also to whether one can have a reasonably certain proof of damages. Suppose that an expert determines that after controlling for market and industry effects a stock declined by $10 in response to a curative disclosure. She must then determine by how much the stock price was inflated earlier in the class period. If the stock traded in an efficient market, then the news provided in the disclosure would generally be assumed to have been accurately valued in the market as worth $10 at the time of the disclosure. If the content of the news did not change over the class period, then one could say that there was an inflation of $10 over the entire class period due to the news in that disclosure. Alternatively, in some cases one might argue that the $10 should be measured using another rule, such as a percentage of the pre-disclosure stock price (that percentage would represent the inflation over the class period).[159]

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different variances are the same and considers both the 0.5% difference in the two figures and the variances (or spread) in the daily returns within each of the two samples.

[159] The choice of a constant-percentage methodology, however, could result in artificially high damages if claims are limited to the $10 loss actually caused by the

If the stock does not trade in an efficient market, however, then it is not clear how any of these rules could apply. That is, if the market for a stock is not efficient, then the $10 price decline caused by the corrective disclosure need not be related to the amount that the stock price was inflated at any point other than the exact moment of the disclosure. Without an efficient market, the same information that caused a $10 decline at the actual disclosure could have caused a $1 decline, a $20 decline, or perhaps even an increase in the stock price, had it been announced at any other time. Therefore, unless the market for a stock is efficient, one cannot use an analysis of the effects of a disclosure to make a reasonably certain estimate of the amount of fraud in a company's stock price at any other point in time.

Also, if tests show that the efficient market hypothesis fails to describe defendant's stock returns, then any estimate of damages would have to be adjusted for the contribution to investment losses attributable to the plaintiffs or other factors beyond the control of the defendants.[160]

V. MARKET INEFFICIENCY AND THE INTERNET BUBBLE

The findings by psychologists and behavioral economists have particular relevance for stocks during the period of the Internet bubble. Specifically, even when Internet stocks possessed many of the features that courts have used as proxies for market efficiency, they still were more likely to be inefficient than non-Internet stocks.

One distinguishing feature about many Internet stocks was that they traded les on the basis of past performance and more on a promise of future performance that was not based on a reasonable growth from the past. While all stock prices are ultimately based on expectations of future cash flows, for established companies like General Motors or Ford, those cash flows can be reasonably estimated and rarely are expected to

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corrective disclosure, as opposed to losses incurred over a period when other factors were impacting the stock price. The same concern applies to any non-constant-dollar measure of inflation.

[160] One approach to estimating damages is to use historic information on how this particular stock, or stocks generally, typically react to earnings surprise announcements. Such estimates would be based on the large and growing literature on earnings response coefficients. The general idea is to measure the inflation not by the difference in stock prices, but by estimating what the effect of the misstatement is directly.

grow at rates well in excess of their past growth rates. Internet stocks differed in that projected future growth rates were often enormous compared to historical growth rates. Analysts struggled to quantify both the new technology and its effect on stock prices. Often, future cash flows were not estimated by using current cash flows as a starting point; instead, "eyeballs" and revenues were used to estimate the size of a *potential* market, which itself was assumed would grow dramatically as Internet usage expanded, to which some expected profit margin was applied. Consequently, there was enormous uncertainty in these cash flow estimates and in the estimates for Internet companies' stock prices.[161]

Along with this uncertainty came the possibility that if one could price Internet company stocks properly, there was, at least in theory, a tremendous profit to be made by picking the proper investments. This feeling only grew as the Nasdaq market took off and many investors were making large gains, apparently by picking any company with ".com" in its name or any tie to the "new economy" of the Internet. One of the interesting consequences of this mania for Internet stocks was that these stocks often appeared to satisfy many of the proxies for market efficiency, such as a large trading volume, a significant number of securities analysts following the stock, and numerous market makers, simply because they were actively traded and followed by those eager to cash in on the fast-growing sector.

In fact, many of the characteristics of Internet stocks actually made them more likely to be traded in an inefficient manner, particularly once they started to take off. For example:

- Because people tended to focus on industries they knew, which obviously were initially successful or they wouldn't be around, then due to *representativeness*, they were likely to overestimate the probability that companies in the dot-com industry would be successful. This effect would cause a large difference from fundamental value, particularly in cases where the actual probability of success was small and ignored.
- Once the Internet stocks started doing well, this misperception became exacerbated as investors'

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[161] *See* Adam M. Zaretsky, *Bubble, Bubble, Toil and Trouble: Asset Prices and Market Speculation*, REGIONAL ECONOMISTS, Apr. 1999 (discussing the uncertainty of whether sharp drops in asset prices may indicate bursting market bubbles).

tendency to use extrapolative expectations biased many into assuming that the previous growth in Internet stocks would be highly likely to continue.

- And, as the Internet stocks rose in value, investors' bias from selling winning stocks held down the number of sell orders that would otherwise have appeared, and which would have exerted downward pressure on these stocks.
- The high betas (or degree of correlation between the stock and the market) meant that investors in Internet stocks would be expected to earn an above-average return in periods when the market was rising. Thus, as long as the market generally was going up, Internet investors would be expected to do extraordinarily well and not be driven out of the market by experiencing poor returns.
- Internet stocks also had characteristics that made potential arbitrageurs even less likely than normal to want to intervene when they felt that the prices of these stocks were unjustifiably high.
- Internet stocks tended to have a very high volatility, which made arbitrage more risky because there could be large changes in the value of an Internet stock or in the difference between an Internet stock and whatever was being used to hedge in the arbitrage attempt.
- Because the overpricing seemed to affect the entire Internet sector, there was not a similar stock with which arbitrageurs could hedge. Therefore, it would be difficult to try to arbitrage away the inefficiencies in the pricing of any particular stock.
- The Internet stock sector was widely perceived as a bubble, but one that had been going on for a number of years. Thus, the probability of the bubble breaking at any point seemed low, and those shorting the sector might have to survive large losses before their bet that the sector was overvalued paid off.

There was never any guarantee that Internet stocks would grow into a bubble, though with hindsight it is easy to see how this came about. Once the bubble began, it was easy to see how it continued and why even those investors who recognized the existence or likelihood of the bubble did not put in sufficient

selling pressure to cause the bubble to burst. It is also easy to see that many of the investors in the Internet sector were not trading on news or economic fundamentals, but on the psychological belief that since the sector had done so well in the recent past, it was likely to continue in the future and they wanted to be along for the ride.

VI. CLASS CERTIFICATION AND THE FRAUD ON THE MARKET THEORY: BACK TO THE BASICS (AND *CAMMER* TOO)

The presumption of reliance in *Basic* is founded upon the acceptance of the efficient capital market hypothesis, upon which the fraud on the market theory is based. The presumption assists plaintiffs in the proving their claims under section 10(b), and greatly assists them at the time of class certification.

There are multiple problems. First, neither *Basic* nor *Cammer* truly set forth readily definitive, measurable factors or markers of market efficiency. This has left courts and litigants to their own devices. The result is a hodgepodge of case law.

Second, though the *Basic* Court might have been convinced on the record before it that the efficient market theory was "solid," and thus very worthy of granting the plaintiffs a presumption (rebuttable or not) of reliance, subsequent research has shown various holes in the efficient market theory.These holes allow us to question whether plaintiffs in section 10(b) cases should always be entitled to such a powerful presumption of reliance simply by invoking a general theory and alleging that it applies to the case at hand, most times without any factual support..

But assuming no change in the status of either *Basic* or *Cammer*—indeed, both have demonstrated longevity, creating create yet another presumption based upon the principle of stare decisis—we have tried above to suggest a solution. That solution really requires a return to the *Basic*[s], to Rule 23 and *Cammer v. Bloom*, in no particular order.

The "*Basics*" start with the fundamental reality of Rule 23. As recently stated by the Fifth Circuit Court of Appeals, "[t]he party seeking [class] certification bears the burden of proof."[162] The burden of proof goes not only to showing compliance with

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[162] Berger v. Compaq Computer Corp., 257 F.3d 475, 479 n.4 (5th Cir. 2001) (citing Castano v. Am. Tobacco Co., 84 F.3d 734, 740 (5th Cir. 1996)).

the requirements of Rule 23(a), but also to showing that the class action "is maintainable under Rule 23(b)(1), (2), or (3)."[163] Because most securities fraud class actions are certified under Rule 23(b)(3), it is thus plaintiffs burden to show that common questions "predominate over any questions affecting only individual members," and that class resolution is "superior to other available methods for the fair and efficient adjudication of the controversy."[164] Thus, under this case law, presumptions or not, it is plaintiffs' ultimate burden to show that common questions of reliance predominate over any reliance questions affecting only individual class members.[165] On a motion for class certification, it is beyond dispute that court may go behind the pleadings to ascertain whether the plaintiffs have met the requirements of Rule 23(a) and 23(b). As noted by the Supreme Court in *General Telephone Company of the Southwest v. Falcon*:[166]

> [T]he class determination generally involves considerations that are enmeshed in the factual and legal issues comprising the plaintiff's cause of action. Sometimes the issues are plain enough from the pleadings to determine whether the interests of the absent parties are fairly encompassed within the named plaintiff's claim, and sometimes it may be necessary for the court to probe behind the pleadings before coming to rest on the certification question.[167]

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[163] Amchem Products., Inc. v. Windsor, 521 U.S. 591, 614 (1997).

[164] *Id.* at 615.

[165] *See* Cammer v. Bloom, 711 F. Supp. at 1264, 1285 n.34 (D.N.J. 1989) (discussing the five elements necessary to invoke the presumption of reliance) (citing Levinson v. Basic, 786 F.3d 741, 750 (6th Cir. 1986)).

> The Third Circuit held in the *Basic* case that in order to invoke the presumption of reliance based upon the fraud on the market theory, a plaintiff must allege and prove five elements. A plaintiff must demonstrate (1) that the defendants made public misrepresentations, (2) that the misrepresentations were material, (3) that the stock was traded on an efficient market, (4) that the misrepresentations would induce a reasonable, relying investor to misjudge the value of the stock, and (5) that the plaintiff traded in the stock between the time the misrepresentations were made and the time the truth was revealed. The Supreme Court essentially approved of these elements but noted elements (2) and (4) may collapse into one.

Id. (internal quotations and citations omitted).

[166] 457 U.S. 147 (1982).

[167] *Id.* at 160 (internal quotations and citations omitted). Indeed, given the holes in the efficient market theory, one might question whether or not a court, in considering a plaintiffs' motion for class certification, could make a rote finding that

Considering that it is a securities class action and it is the plaintiffs' burden to show compliance with Rule 23(b)(3), how might—or as we argue, should—such a showing be made by the plaintiffs that they are entitled to rely on the fraud on the market theory's presumption of reliance? Clearly, some *Cammer* factors can be helpful in establishing indocators that the stock in question was capable of trading in an efficient manner. As demonstrated, however, just relying on many of *Cammer's* factors does not necessarily prove that the stock in question behaved in an efficient manner. Many of the factors, like the existence of market makers and coverage by securities analysts, do not even go to the market behavior of a stock. Other factors, like the average weekly trading volume, are imprecise as well, and certainly do not show or prove market efficiency. Indeed, during the Internet boom, many stocks exhibited relatively high average weekly trading volumes, but also behaved in a volatile manner, often rising many dollars per share without the disclosure of news or material information concerning the company.

In support of their motion for class certification, securities fraud plaintiffs ought to be required to make some detailed showing that the stock in question traded in an efficient manner. Merely demonstrating a single or small number of cases where there is an apparent cause and effect relationship is not enough, since this measures only one point in time during the class period, and only the stock's response to one or a handful of disclosures. If we have learned anything about the advances of knowledge, it is that proper tests of whether an effect is present must be done through the scientific method. One such scientific approach is to examine both a control group and a treatment group and, applying the identical test to both, see whether there is a significant difference in the results. In the case of testing whether there is a cause and effect relationship between news and movements in a stock price, this means not simply finding a case where there was news and a stock price movement, but finding two samples of defendant's stock prices—one with news and one without—and testing whether the price movements for the two samples are distinguishable. Though one may argue as

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a plaintiff is entitled to rely on the fraud on the market theory's presumption of reliance without a detail review of evidence the evidence submitted by a plaintiff under the guise of satisfying *Cammer*.

to how such a price reaction study ought to be performed and what criteria of stock price movement should be deemed significant, as noted by the *Cammer* court, this would be a scientific test of what that Court called "the essence of an efficient market and the foundation of the fraud on the market theory."[168]

[168] *Cammer*, 711 F. Supp. at 1287.